Sierra Nevada Conservancy Grant Program
Safe Drinking Water, Water Quality and Supply, Flood Control,
River and Coastal Protection Act of 2006 (Proposition 84)

Subregion: **CENTRAL** **County: NEVADA**

Applicant: **FRIENDS OF DEER CREEK**

Project Title: **MERCURY BIOAVAILABILITY AND TRANSPORT IN DEER CREEK**

Reference Number: **SNC 070101**

PROJECT SCOPE

This project would monitor contamination in algae, macro-invertebrates, and fish above and below Lake Wildwood to determine the potential transport and dissemination of mercury moving over the dam. Specifically the project actions would include:

- Collect water, sediment, algae, and plant and fish specimens above and below Lake Wildwood dam for analysis for mercury;
- Complete parametric analysis of mercury samples from specimens both above and below the dam. Compare for statistically significant differences and mercury TMDL guidelines;
- Develop recommendations for remediation strategies to reduce the methyl/mercury in Deer Creek;
- Address similar associations throughout the Sierra to present results;
- Communicate with other Sierra Nevada watershed groups to discuss findings and recommendations. Publish findings and study results in a report presented to Sierra Irrigation Districts;
- Develop outreach materials for small irrigation districts in the Sierra Nevada regarding findings;
- Introduce remediation options to limit mercury transport through reservoirs.

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PROJECT SCHEDULE

DETAILED PROJECT DELIVERABLES	TIMELINE
Collect data (from algae, macro-invertebrates, fish)	September 2008
Analyze data	October 2008
Develop remediation strategies	December 2008
Complete report	March 2009
Disseminate information & outreach materials	September 2009
Final Report/Final Payment Request	**December 31, 2009**

PROJECT COSTS

PROJECT BUDGET CATEGORIES	TOTAL SNC FUNDING
Data collection and study design	$24,467
Analysis	$7,000
Remediation strategy development	$2,500
Dissemination/report and outreach materials	$10,500
GRAND TOTAL	**$44,467**

Letters of Support:
- Lake Wildwood Lake Committee.

Recommendation:
Staff recommendation is to fund this project at the requested level of $44,467.

Project Summary

The Mercury Bioavailability and Transport Project is a pilot project to determine the source and transformation of mercury below Lake Wildwood reservoir. Mercury transport and transformation from source areas along Deer Creek, such as abandon mine waste rock piles and hydraulic mining debris, to downstream reservoirs and periodically over dams needs to be better understood in order to prevent contamination downstream and bioaccumulation in the food chain. Understanding key mechanisms of mercury transport and bioaccumulation will allow for improved remediation of source areas and prevention of human health effects from mercury. Small reservoirs such as Lake Wildwood are common in the Sierra and are a critical component to effective mercury remediation because although mercury contaminated sediments accumulate behind reservoirs, mercury is also transported from the concentrated source area behind reservoirs to downstream reaches. We hypothesize that mercury contaminated algae transported over Lake Wildwood is a significant source of methylmercury to the downstream reaches of Deer Creek. We propose a summary of work for which we are requesting $44,467 in support from the Sierra Nevada Conservancy Proposition 84 Category 2 Strategic Opportunity Grant Program. Funding would provide money for:

Task 1 Data Collection: Water, sediment, algae, plants, and fish will be collected and analyzed for mercury above and below Lake Wildwood. Stream discharge will also be measured.

Task 2 Analysis: Parametric analysis of mercury samples from water, sediment, algae, plants and fish above and below Lake Wildwood. Sites above and below Lake Wildwood will be compared for statistically significant different between sites and all mercury data will be compared to mercury TMDL guidelines.

Task 3 Remediation: Develop recommendations to reduce methylmercury in Deer Creek and consider their applicability to other Sierra Watersheds.

Task 4 Dissemination: Communication with other Sierra Nevada watershed groups, and irrigation districts about results and potential implementation strategies for reduction of methylmercury transportation and transformation.

In 2005, as a result of the breadth of Friends of Deer Creek's scientific expertise and commitment, our organization was the only non-governmental organization selected by the California State Regional Control Board and Sacramento County to undertake an assessment of mercury contamination in sediment, water, macroinvertebrates and fish. The data we have collected to date indicate a ubiquitous problem with mercury contamination in sediment, water, and macroinvertebrates in Deer Creek, which we suspect is typical in all the gold mining watersheds of the Sierra. In particular, our macroinvertebrate studies indicate that dams do not prevent mercury bioaccumulation in fauna downstream of the Lake Wildwood dam. There is a possibility that algae and stream plants are a contributing factor to the passage of mercury below Lake Wildwood dam which eventually reaches the Delta. If this is the case, the control of algae and plant blooms could reduce methylmercury accumulation in food chains and its ability to be transported downstream, making a healthier watershed with improved water quality benefits.